ART. XXV.—*Paracentesis Pericardii.*

1. *Paracentesis of the Pericardium; a consideration of the Surgical Treatment of Pericardial Effusions.* By JOHN B. ROBERTS, A.M., M.D., Lecturer on Anatomy in the Philadelphia School of Anatomy, etc. 12mo. pp. 100. Philadelphia: J. B. Lippincott & Co., 1880.
2. *Ein Fall von Paracentesis Pericardii. Aus der medicinischen Klinik zu Freiburgi. B. Freiburger Dissertation.* Von Dr. C. HINDENLANG, Ersten Assistenzarzt der Klinik. *Deutches Archiv für klinische Medicin*, 1879. Bd. xxiv. Heft. 445, pp. 452–482

A Case of Paracentesis of the Pericardium; from the Medical Clinic of Freiburg. By Dr. C. HINDENLANG, Senior Assistant Surgeon to the Clinic, etc.

BY one of those coincidences not infrequent in medical literature, two important and rather elaborate articles on a subject which had heretofore attracted but occasional attention, have appeared almost simultaneously in Europe and America respectively. Both of them contain collections of all the reported cases accessible to their authors; and both of them are illustrated. The object held in view in the American monograph is more comprehensive than that of the essay in the *Deutsches Archiv*, comprising, as it does, a close study of the anatomical relations of the parts concerned in the operation, with a view of determining the points of safety in the surgical procedure itself, and the indications which render it injudicious or otherwise; while it presents an admirably written review of the causes of pericardial effusions, their character, symptoms, and treatment.

Proposed by Riolan in the earlier half of the seventeenth century, the first directions for the operation were, according to Hindenlang, laid down by Senac in 1724, although never performed by him. The first successful operation is accredited to Romero, of Barcelona, in 1819.

Hindenlang reports a recent case by Prof. Bäumler, the one which gave occasion to his essay, and an unpublished one of Prof. Kussmaul of Strassburg; following which, he presents brief records of fifty additional cases collected from various sources. He alludes, in a note, to an imperfect record of thirty additional cases of puncture for scorbutic pericarditis, which are not included in the main text. He follows his record with the remark that according to the collations given, the paracentesis of the pericardium was limited to a mere attempt in six instances, and was actually performed in sixty-five. Leaving eight of his seventy-three cases out of consideration because the operation was not completed, or the result remained doubtful or was unreported, he presents a record of twenty-one of the sixty-five punctures as successful, with more or less complete recovery, and forty-four cases unsuccessful, including the twenty-three for scorbutus not admitted into his detailed list. The awkward manner in which this writer commingles the statistics in his table of fifty cases with the imperfect records of the majority of punctures in scorbutus which are excluded from his table and relegated to a running foot-note, renders it rather perplexing to comprehend the manner in which he arrives at his concluding figures. We should deem it better to consider every puncture of the pericardium, whether in scorbutus or not, a case of paracentesis pericardii and deserving of admission into a statistic table of the procedure.

Roberts furnishes a table of sixty cases with twenty-four recoveries and thirty-six deaths.

Comparing the two records, we find that Roberts includes two cases of Kyber, two of Aran, and one each of Karawagen, Wilezkowski, Skoda, Teale, Herbert Norris, Labric, Chaillou, Duncan, Heath, Saundby, Gooch, Steele, J. Lewis Smith, Viry, Douglas, Porcher, and Comegys Paul,[1] which do not figure in the statistics of the German writer; while the latter includes a case of Dessault, in which a mistake was made,—the accumulation being an encapsuled pleuritic one, an uncertain operation by Larrey, and one positive operation each, by Vigla, Mader, and Gemell, which do not appear tabulated in the record of Roberts. He accredits to T. Clifford Allbutt, a case operated on by Teale; to Gemell, one operated on by Gairdner; to Frémy, one operated on by Ponroy, and already recorded in his table (case 32); and to Moore, one operated on by Gooch; it being probable that want of familiarity with French and English respectively has led him to mistake the reporter for the operator. This explanation will reconcile some apparent discrepancies in the two records. Adding nineteen cases accredited solely to Roberts' table, to the seventy-two (for the case of Ponroy and that of Frémy, in this list, is one and the same case) recorded in Hindenlang's, and the two new cases reported by the latter, we have a total of ninety-three, irrespective of some probable punctures in scorbutus which would swell the number to more than one hundred. The dates and data of the concordant statistics differ a little in the two compilations, owing to the sources of information from which they have been derived; those of German origin being accredited chiefly to original sources in the foreign record, and to the vernacular in the American one. Considerable labour must have been bestowed in looking up authorities and records on both sides of the ocean, and the results in themselves are valuable, though demonstrative of the impropriety of too implicit reliance on the outcomes of mere statistical inquiries.

A successful case of paracentesis of the pericardium in a child nine years of age, performed by Dr. G. M. Staples, of Dubuque, Iowa, June 7, 1877, seems not to have come under the notice of either essayist. In this case death took place from effusion into the brain, two years and six months after the operation, and the autopsy fully confirmed the diagnosis of pericardial effusion. The pericardium was universally adherent, and the heart enormously hypertrophied, weighing twenty ounces. The left auricle was greatly dilated, and its endocardium roughened and gritty. There was mitral insufficiency, with cartilaginous degeneration of the valve. There was no trace of the puncture. The pleuræ were healthy, save for two or three adhesions in the right side. Dr. Staples concluded that life might have been indefinitely prolonged, had the operation been performed earlier.[2]

Quite recently, too, a second operation has been published by Prof. F. P. Porcher,[3] of Charleston, S. C., in which the operation was performed with partial, yet decided, relief upon a female patient seventy years of age, then in the City Hospital, Charleston. Two drachms of fluid were withdrawn from the pericardial sac by means of the needle of the hypodermic syringe. Two attempts at repetition of the procedure on the day following failed to find effused fluid, a few drops of blood, only, appearing in the tube. The withdrawal of the two drachms of fluid, however, seems to have procured a great deal of improvement in her physical condition. This improvement is accounted for by Dr. Porcher, in accordance with Roberts' suggestions, by the supposition of internal drainage into the cavity of the thorax, and possibly subsequent absorption. In the case now mentioned, a return of dyspnœa occurred on the twenty-seventh day after the paracentesis, and ended fatally; the patient being at the time under the care of Dr. Porcher's successor in the hospital. At the autopsy, on the day following, several ounces of fluid were found in the pericardial sac.

---

[1] Since published in the Philadelphia Medical Times, Dec. 6, 1879, p. 115.
[2] The Medical Record, N. Y., Feb. 21, 1880, p. 212.
[3] Louisville Medical News, Feb. 7, 1880, p. 62.

The first case reported by Hindenlang occurred in a male peasant twenty years of age. Without repeating the entire details, it may be stated that the affection seems to have been excited during the beginning of August, 1877, by drinking several glasses of cold beer on an empty stomach, while overheated. Abdominal colic occurred immediately, soon followed by diarrhœa. Rigors occurred at the same time, and were succeeded by increased temperature and sweating. The patient was able to work the next day, but only by dint of great effort. During the ensuing night, thoracic constriction and dyspnœa set in, frequently increasing to such a degree as to compel the sitting posture. About fourteen days later swelling began in the lower extremities, and gradually extended upon the abdomen. The condition of the patient became gradually worse; and on Oct. 26, 1877, he was brought to the hospital in a pitiful condition. The dyspnœa was very great, even when propped up in bed, and rendered speech difficult. The face was slightly cyanotic, the lips and nails quite blue. The inner surface of the upper part of the left thigh was quite œdematous, as was the tissue over the malleolus. The cervical veins were not very full, the external jugular alone being visible, a little distended, and becoming smaller on inspiration. The heart-beat was not visible, nor the slightest thrill to be felt on palpation. The respiration was markedly costal, orthopnœic, and 58 per minute. Pulse 124, irregular and compressible, and almost intermitted at each inspiration. Abdomen rather tense; epigastrium somewhat painful to pressure; no fluctuation discernible. Percussion: Clear at tops of lungs; absolute flatness over the entire sternum, broadening out below, and extending to the maxillary line in the left, and to the anterior axillary line on the right, abutting the line of hepatic flatness at the fifth intercostal space. Auscultation: Cardiac sounds clear, but weak and barely audible; the second pulmonic sound somewhat louder; no pericardial friction-sound audible. The symptoms continued to get worse; and, on Oct. 28th, an attempt was made by Prof. Bäumler to discharge the pericardial effusion with the needle of Dieulafoy's aspiratory apparatus. Three punctures were made unavailingly; and, as a trocar was not at hand, the punctures were protected with plaster, and covered with an ice-bag. On the following day, the patient's condition being still worse, the pericardium was again punctured—a delicate trocar, 1.5 mm. in thickness, being used. The puncture was made in the fifth intercostal space, 4 cm. outwards from the left edge of the sternum, and was about 5–6 cm. in depth. The stylet being removed, and the canule pushed somewhat further in, the aspiratory apparatus was attached, and 300 grammes withdrawn, of a dark-red thin fluid, containing considerable albumen, and but few flakes of fibrin. The grating of the heart against the canula was distinctly felt, and was especially strong towards the end of the operation. Examination of the fluid showed many well-preserved blood-corpuscles in the sediment, and others of stellate form. Fibrin was present in tube-like casts, or in hyaline membrane; the former in part empty and folded on themselves, and in part distended with coarse-grained fatty contents. There was also some fine-grained fibrin.

After the operation, the patient improved during an entire fortnight, when the symptoms again became worse and worse, so that a further puncture of the pericardium was made on Dec. 11th, the point of entrance being the same as before. After the trocar had overcome the first resistances of the intercostal space, it became very much inclined forwards, as though a thick membrane interposed. The movements of the heart against the canula were soon perceptible, and, on pushing the latter further in, after withdrawing the stylet, some drops of yellow serum flowed from it. When about 100 c.cm. of fluid had been withdrawn by aspiration, an inspiratory intermission of the pulse, which had existed for some time, became much less marked. After the removal of about 500 c.cm., the pulse was of the same frequency, and no longer completely compressed at each inspiration, though still diminished in volume. After the removal of 850 c.cm., the pressure on the rubber tube suddenly became very much reduced, and the grating of the heart against the canula was very perceptible. The canula was removed, and found on measurement to have been inserted to the depth of 4 cm. The fluid withdrawn was almost clear, yellowish in colour, with a tinge of green. Microscopic examination revealed many small and large fat globules, nucleated cells, fatty white blood-corpuscles, and variously stellated red blood-corpuscles. There were some cloudy masses of pigment, with numerous fat cells entangled in them.

The operation was followed by great relief. This time, too, as before, there was great increase in the excretion of urine.

Towards the end of the month the patient began to lose ground, and was discharged at his own request on March 26th of the following year. He gradually grew worse and worse, and died in the middle of June. There was no autopsy.

The second case occurred in a cabinet-maker, 21 years of age, with an hereditary predisposition to phthisis. Early in November, 1876, he was seized with pleurisy of the right side, for which paracentesis was performed Jan. 7, 1877; and on Jan. 11th he was admitted to the hospital at Strassburg under care of Prof. Kussmaul. The patient had great œdema of the lower half of the body, with ascites; and, in addition to a copious right-sided pleural exudation, a large pericardial effusion extending over both sides of the sternum above, along the second costal cartilage to the left axillary line. There was great dyspnœa, increasing to orthopnœa; and the pulse was small, irregular, and varying in frequence between 100 and 130. On Jan. 14th, Prof. Kussmaul punctured the thorax with Dieulafoy's apparatus. The needle was plunged into the fifth intercostal space of the right side, about 1.5 cm. to the outside of the mammillary line. At first, 20 c.cm. of clear serum was discharged. As the needle was pushed further around, a turbid brownish-red fluid flowed out at once, of which about 750 c.cm. were withdrawn. This fluid contained a great quantity of altered blood-corpuscles, but no normal fresh ones. The result of the operation was admirable. The excretion of urine increased from 600 c.cm. to 3000 c.cm. per diem. The two kinds of fluid withdrawn led Prof. Kussmaul to conclude that the first came from the pleura, the second from the pericardium.

On Jan. 18th, the operation was repeated, and in precisely the same manner, to see whether two varieties of fluid would be withdrawn. The needle was plunged in at the same point, and held in position as soon as the fluid flowed. In this manner about 550 c.cm. of clear serous fluid was discharged. Then the needle was advanced, and directed more towards the middle line to penetrate the distended pericardium. A clear red bloody serum flowed out, of which 250 c.cm. were discharged. It contained fresh normal blood-corpuscles. Great relief followed this operation likewise. By March, the œdema and ascites had disappeared; and on the 8th of May the patient was permitted to return to his home.

As to the method of operation, preference is given to aspiration as a matter of course in both essays. This method of operation is of such recent adoption that even Hayden, at the date of publication (1875) of his extensive treatise on diseases of the heart, was unaware of any instance in which the pneumatic aspirator had been used in the performance of this operation. He gives a table of eighteen operations in which the bistoury was the principal instrument used in eleven instances, and the trocar and canula in three.

The point of puncture, which is discussed in a few sentences by Hindenlang, who recommends the third, fourth, or fifth intercostal space, according to the extent of cardiac dulness, and at a point from three to four centimetres external to the left border of the sternum, is discussed in considerable detail by Dr. Roberts, who concludes that the best point, unless individual peculiarities render another preferable, will be in the fifth space, nearer the rib below than that above, and from two to two and a quarter inches to the left of the median line of the sternum. Dr. Roberts likewise gives minute directions as to the methods of operating, and choice and supervision of implements. He discusses the dangers to be encountered from untoward wounding of the internal mammary artery, or the substance of the heart itself. A few cases are instanced in which the cavity of the heart had been penetrated without giving rise to a fatal issue from that cause. Dr. Porcher, in the article above referred to, prefers to select the central point of dulness as the point of puncture, paying less regard to the anatomical relations of the parts, inasmuch as displacement may have occurred, as in his own second case.

In the absence of authoritative data, even in elaborate treatises on diseases of the heart, it is quite probable that the essays we have discussed will encourage physicians to enlist surgical aid in cases of pericardial effusion imperilling life, and that the operation of penetrating the pericardium will be approached with greater confidence than heretofore. Roberts' monograph in particular is well worthy of careful study. J. S. C.

ART. XXVI.—*Report on the Revision of the U. S. Pharmacopœia, preliminary to the Convention of* 1880. *Being a Rough Draft of the General Principles, Titles, and Working Formulæ proposed for the next Pharmacopœia.* Prepared and compiled by CHARLES RICE, Chairman of the Committee on the Revision of the U. S. Pharmacopœia of the American Pharmaceutical Association. 8vo. pp. xviii., 202. New York, 1880.

THE medical profession of our country, individually, and through their organized associations, have been singularly indifferent to their official standard of the Materia Medica—the U. S. Pharmacopœia. The very existence of such a work is unknown to many, and by others the Pharmacopœia is confounded with the U. S. Dispensatory of Wood and Bache. As the sixth decennial revision is now approaching, and as much of the preliminary work has already been done, it is an appropriate time to consider the relations of the profession to this national standard which is intended to be of national authority, not by virtue of Congressional Enactment, but by the moral force of the medical and pharmaceutical bodies.

Is a national standard of the Materia Medica desirable? To answer such a question would seem to be a labour of supererogation if it were not for the remarkable apathy exhibited by the medical profession. The experience of older communities and States has shown the necessity for a national standard, and as the intercourse between nations becomes more intimate, the need of an international, or universal Pharmacopœia, is strongly felt. Uniformity is desirable for convenience, to obtain greater accuracy and perfection in the processes, and to prevent mistakes. If every pharmaceutist had his own formulæ, if the preparations varied accordingly, if each physician prepared his own Pharmacopœia, the confusion would speedily become worse confounded. Indeed, it needs no argument to demonstrate that a standard is necessary, especially in a country like ours, the inhabitants made up of various nationalities, the